CLAIMS

1. A rotary electrical machine of the type which comprises at least one member (14, 16) on which at least one electrical winding (32, 62) is formed, the winding comprising at least one electrically conductive element (34) which is wound in such a way as to form the winding and which is coated with at least one layer (36) of electrically insulating material, characterised in that, prior to the winding step, the coated conductive element (34) is clad with a connecting layer (72) consisting of at least one connecting material (73) that joins together adjacent portions of the coated electrically conductive element (34), in that an electrically insulating leaf (44, 100) is interposed between the winding (32, 62) and the member (14, 16) on which the winding (32, 62) is formed, and in that the insulating leaf (44, 100) comprises an electrically insulating structural element (74), on at least one of the faces of which a second connecting material (76) is applied at least partially, whereby to join the insulating leaf (44) to the winding (32, 62) and/or the member (14, 16) on which the winding (32, 62) is formed.

2. A rotary electrical machine according to Claim 1, characterised in that the structural element (74) is at least partially impregnated by the second connecting material (76).

3. A rotary electrical machine according to Claim 1, characterised in that the second connecting material (76) is identical to the first connecting material (73).

4. A rotary electrical machine according to Claim 1, characterised in that the structural element (74) is a leaf of electrically insulating paper.

5. A rotary electrical machine according to Claim 1, characterised in that the structural element (74) is made of electrically insulating cloth.

6. A rotary electrical machine according to Claim 1, characterised in that at least one of the connecting materials (73, 76) comprises a polymer.

Sub A'

7. A rotary electrical machine according to the preceding Claim, characterised in that the polymer is of the thermosetting type.

8. A rotary electrical machine according to Claim 6, characterised in that the polymer is of the thermoplastic type, the melting point of which is higher than the maximum working temperature of the rotary electrical machine.

9. A rotary electrical machine according to Claim 1, characterised in that the member (14, 16) on which at least one winding (32, 62) is formed is a stator (14).

10. A rotary electrical machine according to Claim 1, characterised in that the member (14, 16) on which at least one winding (32, 62) is formed is a rotor (16).

11. A rotary electrical machine according to Claim 1, characterised in that it is an alternator (10).

12. A method of making a member (14, 16) for a rotary electrical machine on which there is formed at least one electrical winding (32, 62) comprising at least one electrical conductive element (34) which is wound in such a way as to form the winding (32, 62), and which is coated with at least one layer (36) of electrically insulating material, of the type which includes a step of winding the conductive element (34) in such a way as to form the electrical winding (32, 62), characterised in that prior to the winding step, the coated conductive element (34) is clad with a connecting layer (72) consisting of at least one connecting material (73) that joins together two adjacent portions of the coated electrically conductive element (34), in that the winding step is followed by a step of changing the state of the connecting material (73) so as to cause it to soften or melt whereby it fills, at least partially, the interstices that exist between the adjacent portions of the conductive element (34), and so as then to cause it to solidify once again, whereby to join together the adjacent portions of the conductive element (34), in that an electrically insulating leaf (44), which comprises a structural element (74) at least partially coated or impregnated with a second connecting material (76), is interposed between the winding (32, 62) and the member (14, 16) on which the winding (32, 62) is formed, and in that, during the step of changing state, the second connecting material (76) is softened or melted and is then once again solidified, and joins together the insulating leaf (44) and adjacent portions of the conductive element (34) and/or the member (14, 16) on which the winding (32, 62) is formed.

SUB A2

13. A method according to the preceding Claim, characterised in that at least one of the first or second connecting materials (73, 76) comprises a polymer, and in that the step of changing state causes its polymerisation to take place.

14. A method according to Claim 12, characterised in that, in association with the step of changing state, the winding (32, 62) is formed into a predetermined shape by means of a shaping tool (78,

93), which exerts a force on at least one zone of the winding (32, 62) in such a way as to deform it.

15. A method according to the preceding Claim, characterised in that the winding (32, 62) is given its predetermined shape by means of a shaping tool (78, 93) which exerts at least a radial force on at least one axial annular zone of the winding (32, 62), so as to deform it and to determine at least one diameter of the winding (32, 62).

16. A method according to Claim 14, characterised in that the winding (32, 62) is put into its predetermined shape by means of a shaping tool (78, 93) which exerts an axial force on at least one radial annular zone of the winding (32, 62), so as to deform it and to determine the axial dimension of the winding (32, 62).

17. A method according to Claim 14, characterised in that the winding (32, 62) is given its predetermined shape by means of a shaping tool (78, 93) which exerts a force on a peripheral annular face of the winding (32, 62) in such a way as to give it a convex form.

18. A method according to Claim 14, characterised in that the winding (32, 62) is put into its predetermined shape by means of a shaping tool (78, 93) which deforms the winding (32, 62) in such a way as to form at least one notch (92) on a peripheral face, in particular a recess formed on an external annular peripheral face (90), to permit passage of at least one axial claw (68, 70) of a pole wheel (64, 66), where the member (14, 16) is a rotor (16) and the rotary electrical machine (10) is an alternator (10).

19. A method according to Claim 14, characterised in that the step of changing state comprises a step of heating the connecting layer (72) to a hardening temperature higher than or equal to the melting point of the first connecting material (73), whereby to cause it to melt so that it fills at least partially the interstices that exist between the adjacent portions of the conductive element (34), and a cooling step, in the course of which the first connecting material (73) solidifies once again and joins together the adjacent portions of the conductive element (34).

20. A method according to the preceding Claim, characterised in that, during the heating step, the second connecting material (76) which coats or impregnates the structural element (74) of the leaf (44) is brought to a temperature higher than its melting point, and in that, during the cooling step, the second connecting material (76) solidifies once again and joins together the insulating leaf (44) and adjacent

sub at end

portions of the conductive element (34) and/or the member (14, 16) on which the winding (32, 62) is formed.

21. A method according to Claim 20, characterised in that, in association with the cooling step, the winding (32, 62) is formed into a predetermined shape by means of a shaping tool (78, 93) which exerts a force on at least one zone of the winding (32, 62) in such a way as to deform it.

22. A method according to Claim 19, characterised in that the heating step consists in heating the electrically conductive element (34) at least partially, by Joule effect, in such a way as to bring the temperature of at least one of the connecting materials (73, 76) to a temperature higher than or equal to its hardening temperature.

23. A method according to Claim 19, characterised in that the heating step consists in heating the electrically conductive element (34) at least partially by induction, by placing the winding (32, 62) in a magnetic field whereby to bring the temperature of at least one of the connecting materials (73, 76) to a temperature higher than or equal to its hardening temperature.

24. A method according to Claim 19, characterised in that the heating step consists in heating at least one of the connecting materials (73, 76) at least partially by stoving, whereby to bring the temperature of at least one of the connecting materials (73, 76) to a temperature higher than or equal to its hardening temperature.

25. A method according to Claim 19, characterised in that the step of changing state consists in projecting a reactive substance such as alcohol on at least one of the connecting materials (73, 76), whereby it causes it to soften or melt and then once again causes it to solidify.

26. A method according to Claim 12, characterised in that the step of changing state is preceded with a step of preheating the member.